

Abstract Submitted  
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**Doping-induced line nodes in the superconducting gap of the iron arsenide  $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$  from thermal conductivity** R.T. GORDON, J.-PH. REID, X.G. LUO, H. SHAKERIPOUR, S. RENÉ DE COTRET, A. JUNEAU-FECTEAU, N. DOIRON-LEYRAUD, J. CHANG, LOUIS TAILLEFER, University of Sherbrooke, Canada, H. KIM, M.A. TANATAR, R. PROZOROV, Ames Laboratory and Iowa State University, USA, B. SHEN, H.-H. WEN, Nanjing University, China — The thermal conductivity  $\kappa$  of  $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$  was measured down to 50 mK in magnetic fields up to 15 T, for heat current both parallel and perpendicular to the tetragonal c axis, across a range of K concentrations from optimal doping ( $T_c=38$  K) down to  $T_c=7$  K, deep into the region of coexistence with antiferromagnetic order. From optimal doping down to  $T_c \simeq 15$  K, well into the coexistence region, there is no residual linear term in  $\kappa(T)$  as  $T \rightarrow 0$ , showing that there are no nodes in the superconducting gap anywhere on the Fermi surface. For concentrations in a narrow range such that  $9 \text{ K} < T_c < 13 \text{ K}$ , a large residual linear term appears, signaling the onset of nodes in the superconducting gap, most likely vertical line nodes running along the c axis. For  $T_c < 9 \text{ K}$ , the gap is again nodeless. We propose that these changes in the superconducting gap structure are triggered by changes in the Fermi surface as it is reconstructed by the growing antiferromagnetic order.

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